SONY

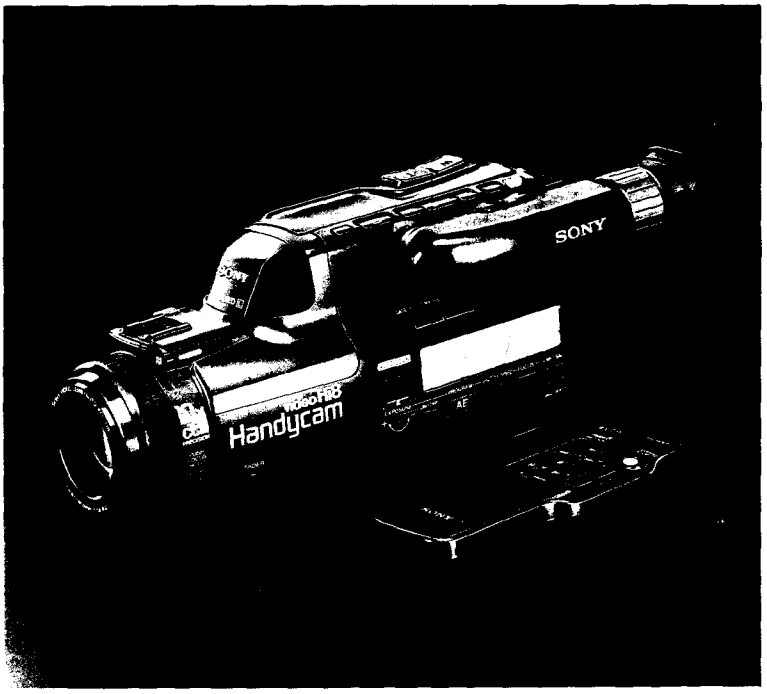
3-755-551-21 (1)

Video Camera Recorder Hi8

CCD-FX710

Operation Manual

Before operating the unit, please read this manual thoroughly and retain it for future reference.



video Hi8 Handycam

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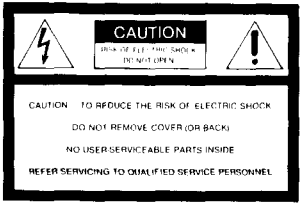
WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Information for the customers in the U.S.A.

Warning: You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice for the customers in Canada
This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

Owner's Record

The model and serial numbers are located on the bottom. Record the serial number in the space provided on the right hand. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. CCD-FX710

Serial No. _____ ___

Table of Contents

Before You Begin
About this Manual 4
Checking Supplied Accessories 5
Before You Start 5

Chapter 1

Getting Started
Checking the BEEP Switch 6
Charging and Installing the Battery Pack 6
Inserting the Lithium Battery 8
Setting the Date and Time 9
Storing a Birth Date in Your Camcorder 10
Inserting a Tape 12
Adjusting the Viewfinder Lens 13

Chapter 2

Basic Operation
Camera Recording 14
Zooming 16
Playing Back a Tape 17
Using the Remote Commander 19
Getting the Most out of Your Battery Pack 20

Chapter 3

Advanced Operation
Alternative Power Sources 22
Using the Household Current 22
Using a car Battery 23
Camera Recording 24
Recording the Date or Time 24
Recording in Low Positions 24
Checking the Recorded Picture inside the Viewfinder (EDITSEARCH) 25
Inserting a Scene in the Middle of a Recorded Tape (Insert Recording) 26
Recording with an External Microphone 27
Connecting a Wired Remote Control Unit 27
Using the Stand 27
Recording an Age 28
Selecting Automatic/Manual Adjustment Mode 29
Focusing Manually 29
Fixing the Focus to the Object 31
Adjusting the White Balance 31
Using the High-speed Shutter 33
Adjusting the Exposure 34
Using Program AE 35
Fade-in and Fade-out 36
Superimposing Text 37
Playing Back a Tape 40
Recording 43
Editing 45

Chapter 4

For Your Information
Usable Cassettes and Recording/Playback Modes 48
Maintenance Information 49
Tips for Better Camera Recording 51
Using your Camcorder Abroad 52
Precautions 52
Identifying the Parts 53
Indicators in the Viewfinder and the Display Window 56
Troubleshooting 57
Specifications 59
Index ..... Back cover

Welcome to Video Hi8

Congratulations on your purchase of this Sony Handycam® camcorder. With your Handycam you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

About This Manual

This manual shows you how to operate your camcorder. To get the most out of the features of Handycam, read this manual thoroughly before you use your camcorder. If you want to shoot as soon as possible however, please read the chapters, **Getting Started** and **Basic Operation.** Once you are familiar with basic operations, you may want to proceed to the chapter, **Advanced Operation.**

- When you are reading through this manual, buttons and settings on the camcorder are shown in capital letters:
  e.g. Slide the POWER switch to CAMERA.
- Use "Identifying the Parts" on page 53 as a guide to find functions and operations printed on the camcorder itself.

Note on TV Color Systems

TV color systems are different depending on the countries.
If you view the playback picture on a TV, you need an NTSC system based TV or a PAL-M system based TV with NTSC/PAL-M transcoder (as this is an NTSC system based camcorder). Please check the list on page 52 to see the TV color system of your country.

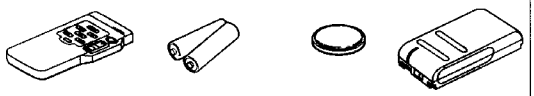
Note on copyright

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to provisions of the copyright laws.

Checking Supplied Accessories

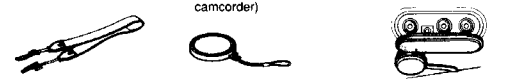
Check that the following accessories are supplied with your camcorder.

- Wireless Remote Commander (1)
- Size AA (R6) battery for Remote Commander (2)
- Lithium battery CR2025 (1)
- Battery pack NP-55H (1)



- AC power adaptor with the connecting adaptor AC-V65/V65A (1)
- A/V connecting cable (1)
- RFU adaptor RFU-90UC (1)
- S video connecting cable (1)

- Shoulder strap (1)
- Lens cap (1) (attached to the camcorder)
- Jack cover (1) (attached to the camcorder)



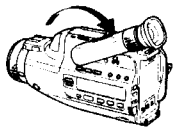
Before You Start

Before you can use your camcorder, you need to:

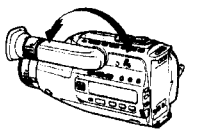
1 Check the BEEP switch.
2 Charge and install the battery pack.
3 Insert the lithium battery.
4 Set the date and time.
5 Insert a tape.
6 Adjust the viewfinder lens to your eyes.

Chapter 1 takes you through these procedures step by step.

To use the camcorder
Turn the viewfinder barrel backward.

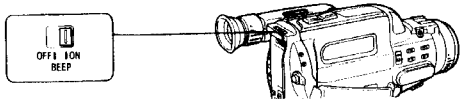


To store the camcorder
Turn the viewfinder barrel to the front.



Checking the BEEP Switch

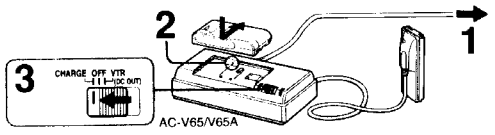
A beep sounds when you start recording and two beeps sound when you stop recording so that you can confirm the operation. Beep is not recorded on the tape. Also, several beeps sound as a warning of any unusual condition of the camcorder.
If you do not want to hear the beep sound, set the BEEP switch to OFF.



Charging and Installing the Battery Pack

Before you can use your camcorder, you need to charge and install the battery pack.

Charging the Battery Pack



1 Plug the AC power adaptor into a wall outlet.
2 Attach the battery pack to the AC power adaptor.
— Align the side of the battery pack with the line on the AC power adaptor.
— Push the battery pack down and slide it in the direction of the arrow.
3 Set the CHARGE/VTR switch on the AC power adaptor to CHARGE.

When charging is completed, the charge indicator on the AC power adaptor goes out.

Required charging time:

Type of battery pack	NP-55H (supplied)	NP-77H/ NP-77HD	NP-77	NP-66H	NP-55
Required charging time	70	140	120	110	60

(approx. time in minutes using AC-V65/V65A)

Important!

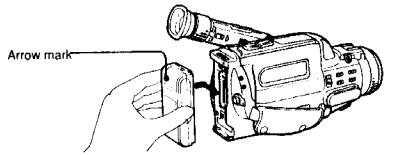
Use the battery completely before recharging!

Before you recharge the battery, make sure the battery has been used (discharged) completely to avoid reducing the capacity of the battery caused by excessive charging.

To use up the battery, remove the video cassette and simply slide the POWER switch to CAMERA with the battery attached, and leave the camcorder until the ☐ indicator and the red lamp flash in the viewfinder.

Installing the Battery Pack

When you have finished charging the battery, install the battery pack as follows:



1 Lift up the viewfinder.
2 Align the right side of the battery pack with the white line on the camcorder.
3 Slide the battery pack to the right.

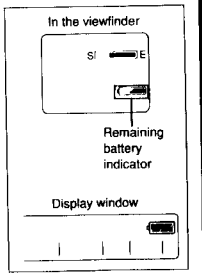
Battery life A fully charged battery pack lasts for:

Type of battery pack	NP-55H (supplied)	NP-77H/ NP-77HD	NP-77	NP-66H	NP-55
Battery life	55	120	100	80	50

(approx. time in minutes, continuous recording when used indoors)

Checking the remaining battery

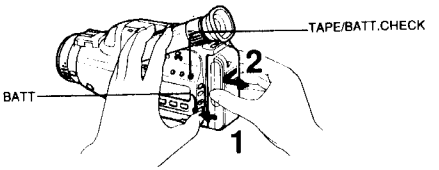
1 Slide the power switch to CAMERA.
2 Turn the STANDBY switch up.
3 Press TAPE/BATT. CHECK.
The bar of the remaining battery indicator in the viewfinder and the display window shows remaining battery power. When the battery is used up, the bar goes out, the ☐ and red lamp flash in the viewfinder. When they flash rapidly, replace the battery pack.
To turn off the remaining battery indicator in the viewfinder, press TAPE/BATT.CHECK again. You cannot turn off that in the display window.



Note
When you use the supplied battery pack, the remaining battery indicator of the camcorder may not be accurate. When you use the NP-77HD battery pack (not supplied), the indicator shows more accurate capacity.

Removing the battery pack

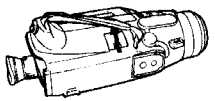
Press BATT in the direction of the arrow **(1)**, and at the same time, slide out the battery pack to the left **(2)**.



Inserting the Lithium Battery

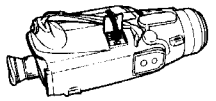
To keep title and birth dates in the camcorder's memory, as well as to activate the clock, insert a lithium battery.
Note that the lithium battery has a positive (+) and a negative (–) sides as illustrated below. Be sure to install the lithium battery with the positive (+) side facing out.

1 **Open the lid of the lithium battery compartment located behind the grip strap.**



2 **Insert the supplied lithium battery with the positive (+) side facing out.**

3 **Close the lid.**



Lithium battery life

The battery lasts for about 1 year. When the lithium battery becomes weak, the ♲ indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of any other battery may present a risk of fire or explosion.**

Note on replacing the lithium battery

When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to reset the date, time, and birth date.

Warning

Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

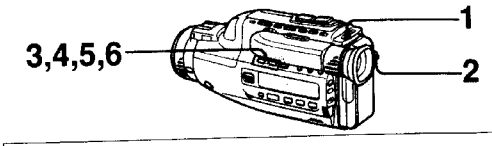
Caution

Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.

Setting the Date and Time

You need to set the camcorder's date and time to be able to superimpose the date and time onto your video.

Make sure that a power source is attached and a lithium battery is inserted.

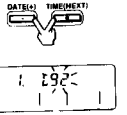


1 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

2 **Turn the STANDBY switch up.**

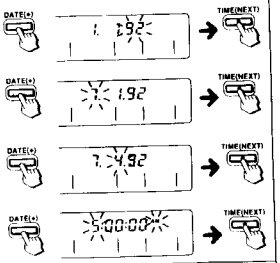
3 **Press DATE (+) and TIME (NEXT) simultaneously for a few seconds until the date indicator appears in the display window.**

The DATE button now functions as + (to advance numbers) and the TIME button functions as NEXT (to set).

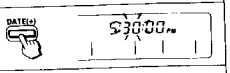


4 **Adjust the flashing digits of the year, month, day, and hour by pressing DATE (+) and TIME (NEXT).**

Note
When you keep DATE (+) pressed, the digits advance faster.



5 **Adjust the flashing minute digits by pressing DATE (+).**



6 **Press TIME (NEXT).**
The clock starts working.

Correcting the date and time settings

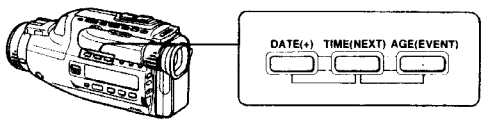
Repeat steps 3 to 6.

Storing a Birth Date in Your Camcorder

When your child's birth date is preset in the camcorder, you can put your child's age, in years and months, on your tape. You can also preset the date of an event. Once you enter the birth date of your child, the clock inside the camcorder will automatically update the age of your child. You can preset up to three birth dates or events.

Before you store a birth date in your camcorder, make sure that a power source is connected, that the lithium battery is inserted and that the date is correctly set.

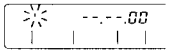
Example: store "Aug. 3, 1987" in memory 2.



1 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

2 **Turn the STANDBY switch up.**

3 **Press TIME (NEXT) and AGE/EVENT simultaneously for a few seconds until the "1" indicator appears in the display window.**



In the display window

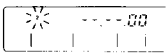
4 **Press DATE (+) to select 2.**

Each time you press DATE (+), the indicator in the display window changes as follows:

1 → 2 → 3
↑_____↓

In the viewfinder, the indicator changes as follows:

1 BIRTHDAY → 2 BIRTHDAY
↑——— 3 EVENT* ←——↓

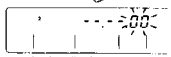


In the display window

* Although "EVENT" is displayed on 3, you can use it for age as well. 1 and 2 can also be used to record event dates in memory.

5 **Press TIME (NEXT).**

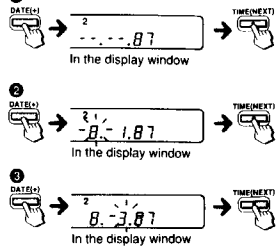
The "00" indicator flashes.



In the display window

6 **Enter the birth date of your child.**

First adjust the flashing digits by pressing DATE (+), and then press TIME (NEXT).
The age (year and month) appears when all the items are adjusted.



If you missed the correct number with DATE (+)

Keep pressing DATE (+).
The indicator in the display window changes as follows:

Year: 00 → 01 - - - → Current year
↑
Current year minus 99 ←

Month: 1 → 2 - - - → 12 → ---
↑_____↓

Day: 1 → 2 - - - → 31
↑_____↓

Correcting and changing the setting

Follow the procedures from step 1 again.

Advancing the digits faster

Keep DATE (+) pressed.

Presetting the year before 1900

1 After step 5 on page 10, keep pressing DATE (+) until the current year is displayed.
2 Press DATE (+) again.
The year goes back 99 years.
(example: 1992 → 1893)
3 Go to step 6 above.

When in 2000

"--.--.01" is displayed in step 3 on page 10. After that, it advances every year as "02" (1902), "03" (1903),---.

To cancel a stored birth date

1 Perform steps 1 to 4 to select the memory number to be canceled.
2 Press TIME (NEXT) twice. The month indicator flashes.
3 Press DATE (+) until "--- --" appears.
4 Press TIME (NEXT).
The birth date is deleted from the memory and is not displayed when you press AGE/EVENT.

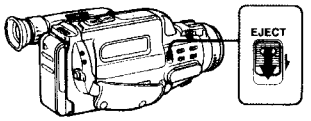
Inserting a Tape

Make sure that the battery pack or other power source is attached to the camcorder before you insert a tape. About the tape you can use, see page 48.

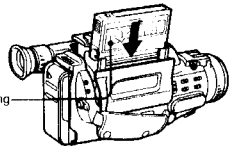
Note

When you record in Hi8 system, prepare a Hi8 video tape.

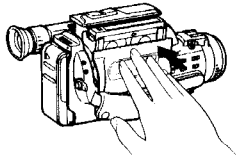
1 **While pressing the small blue button on the EJECT knob, slide the knob down.**
The cassette compartment automatically lifts up and opens toward you.



2 **Insert a tape with the window facing out.**



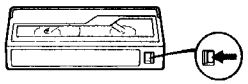
3 **Press the "PUSH" mark on the cassette holder to close it.**



Preventing Accidental Erasure

To prevent accidental erasure, slide the tab on the cassette to expose the red mark.

To re-record on this tape, slide the tab back out covering the red mark.
If you try to record with the red mark exposed, the ⌧ and ⏏ indicators flash in the viewfinder and the display window and you will hear beep sounds for about 5 seconds.

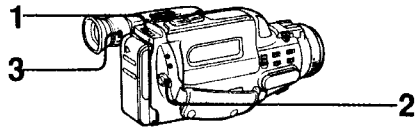


Note on handling tapes

Do not insert anything in the small holes on the rear of the cassette. These holes are used to sense the type and thickness of tape, or if the red mark is exposed or covered, etc. Store tapes in their cases and keep them in an upright position to protect them from dust and uneven winding.

Adjusting the Viewfinder Lens

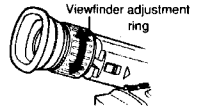
Before you use the camcorder for the first time, adjust the viewfinder lens to best fit your eyesight. Make sure that a battery pack or other power source is attached to the camcorder and a tape is inserted.

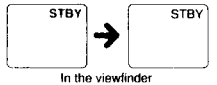


1 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

2 **Turn the STANDBY switch up.**

3 **Turn the viewfinder adjustment ring until "STBY" in the viewfinder comes into sharp focus.**





In the viewfinder

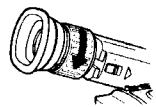
Using the Viewfinder as a Sports Finder

What is a sports finder?

Since this finder has a long focal length, you can monitor the picture while your eye is at a distance from the eyecup. The sports finder is convenient when moving around to shoot scenes.

Setting the viewfinder to the sports finder position

Turn the viewfinder adjustment ring clockwise completely.

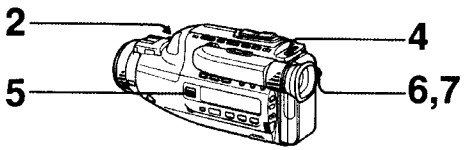


Returning to the normal viewfinder position

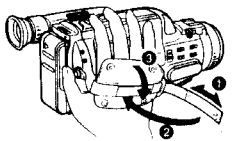
Turn the adjustment ring counterclockwise until "STBY" in the viewfinder comes into sharp focus.

Camera Recording

This section describes the basic procedure for recording.
Make sure that a battery pack (see page 6) or any other power source (see page 22) is attached.
Before you record one-time events, you may want to make a trial recording to make sure that the camcorder is working perfectly.
Keep the lens clean or the focus cannot be adjusted properly.



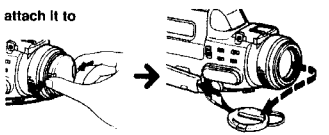
1 **Hold the camcorder by putting your hand through the grip strap and adjust its length so that your thumb can easily press the red START/STOP button.**



2 **Slide Hi8 AUTO/OFF to AUTO.**

If you want to record in the standard 8 mm system, set to OFF. Otherwise, set to AUTO. For details, see page 48.

3 **Remove the lens cap and attach it to the grip strap.**



4 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

This puts the camcorder in camera recording mode.

5 **Set the AUTO LOCK switch to the green position.**

This switches all the camera functions automatic (i.e. autofocus, auto exposure, auto white balance and set the shutter speed to normal (1/60 seconds)).

6 **Turn the STANDBY switch up.**

"STBY" appears in the viewfinder. Now, you can see a picture through the viewfinder.

In the viewfinder

7 **Press START/STOP once.**

The camera is recording when "REC" appears and the red lamp lights up in the viewfinder. You can also confirm the recording start with the beep sound when BEEP is set to ON.
In the viewfinder you can see a black and white picture of what you are recording and information that indicates what the camcorder is doing.

In the viewfinder

red lamp

To stop recording momentarily

Press START/STOP again. "STBY" appears in the viewfinder. The camcorder beeps twice when BEEP is set to ON.

When you have finished recording

Turn STANDBY down, set POWER to OFF and put on the lens cap.

Ejecting the tape

Make sure that the power source is attached.
1 While pressing the small blue button on the EJECT knob, slide the knob in the direction of the arrow.
2 Take out the tape.
3 Close the cassette holder by pressing the "PUSH" mark on the cassette holder.
When there is no tape, the indicator appears in the display window and the viewfinder.

Near the end of the tape

The indicator in the display window and the viewfinder, and the red lamp in the viewfinder, as well as the camera recording/battery lamp on the camcorder, flash slowly. When the tape reaches the end, the flashing becomes rapid and beeps sound for about five seconds when BEEP is set to ON.

Note on recording

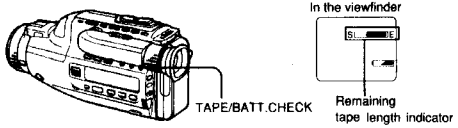
When you record from the beginning of the tape, run the tape for about 15 seconds before the actual recording. This will ensure that you will not miss any start-up scenes when the tape is played back.

If you leave the camcorder in standby mode for 5 minutes or more

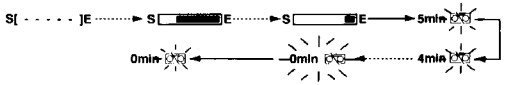
The camcorder goes off automatically. To re-enter standby mode, turn STANDBY down once and turn it up again. To start recording, press START/STOP.

Checking the remaining tape

Press TAPE/BATT.CHECK during recording or in standby mode.

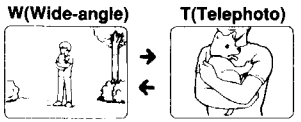


The remaining tape length indicator appears in the viewfinder.
(It may take about 20 seconds to display it.) When the remaining time is less than about 5 minutes, the indicator shows the remaining time in minutes.



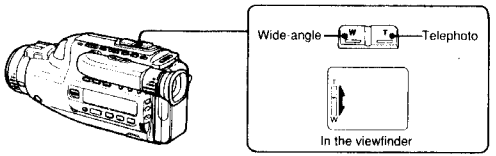
Zooming

Zooming is a recording technique that lets you change the size of the subject in the scene. Use "Zoom-in (telephoto)" for dramatic close-ups, and "zoom-out (wide-angle)" for panoramic long shots. You can also use zooming to focus manually or to decide on a shooting angle. For more professional-looking recordings, use zooming sparingly.



To zoom

Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

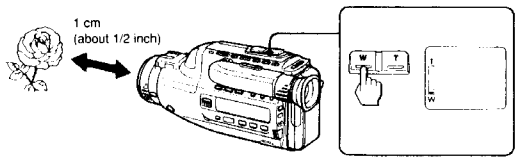


The camcorder's power zoom button offers variable speed zooming; press it firmly for high speed zooming and softly for normal speed zooming.
The variable speed zoom cannot be operated with the power zoom button on the Commander.

Close-up (Macro)

You can shoot subjects that are at least 1 cm (about 1/2 inch) away from the lens surface.

Press the W side of the power zoom button until the power zoom indicator inside the viewfinder stops at the W end.



Manual adjustment

You can shoot with manual focus while doing close ups. For manual focusing, see page 29.

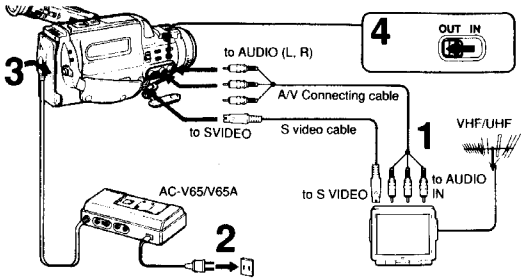
Note When doing close-ups, the depth of field (range the subject will be in sharp focus) is very shallow, so pay attention to focusing. To keep the subject in focus, use a tripod.

Playing Back a Tape

You can use this camcorder to function as a VCR by connecting it directly to your TV for playback.

When your TV has an S video input, connect as shown below. In order to view the picture recorded in Hi8 system with high quality picture, we recommend you connect the camcorder to a TV having an S video input. When your TV has video/audio inputs, see page 40. If your TV has only an antenna input, see page 41.

Connecting a TV with an S Video Jack



1 Connect the camcorder and the TV using the supplied S video and A/V connecting cables.
You do not need to connect the yellow (video) plug of the A/V connecting cable.
2 Plug the AC power adaptor to a wall outlet.
3 Attach the connecting plate of the AC power adaptor to the camcorder.
4 Set the IN/OUT selector on the camcorder to OUT.

Note

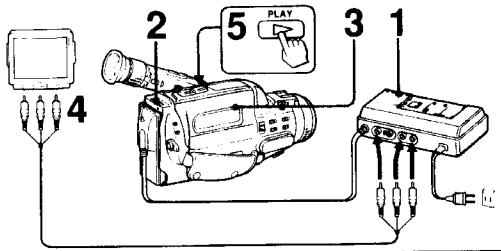
Disconnect the AC power adaptor from the wall outlet when it will not be used for a long time.

About the AUDIO/VIDEO jacks

The AUDIO/VIDEO jacks on this camcorder work as both input and output jacks. Set the IN/OUT selector as follows:

OUT position	to view the playback picture/to edit on another VCR
IN position	to record from another VCR or a TV

Playing Back a Tape



1 **Set the CHARGE/VTR switch of the AC power adaptor to VTR.**

2 **While pressing the small green button on the POWER switch, slide it to VTR.**

3 **Insert a tape.**

4 **Set the TV/VCR selector on the TV to VCR.**
If you are connecting with an RFU adaptor (page 41), turn on the TV and select the channel that you selected for the RFU adaptor (3 CH or 4 CH).

5 **Press ▷ (PLAY).**
Playback starts.

To stop playback, press □ (STOP).
To rewind the tape, press ◀◀ (REW).
To fast-forward the tape, press ▶▶ (FF).

When you have finished playback

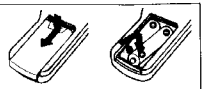
1 Set the POWER switch to OFF.
2 Set the CHARGE/VTR switch on the AC power adaptor to OFF.

Using the Remote Commander

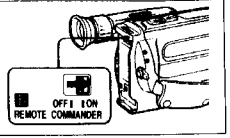
You can use the Remote Commander to record yourself with your friends or family, or conveniently control the playback of your tape from a distance.

Preparing to Use the Remote Commander

1 **Insert two size AA(R6) batteries with correct polarity.**



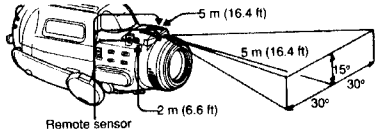
2 **Set the ■ REMOTE COMMANDER switch to ON.**
If the battery is attached, detach it. Reattach the battery after setting the switch.



Using the Remote Commander

Aim the Remote Commander at the remote sensor of the camcorder and press the button on the Remote Commander.

Maximum distance and angles for remote control



To prevent misoperation

Slid the HOLD switch in the direction of the arrow. None of the buttons on the Remote Commander will work. Use this to prevent any misoperation, such as accidentally pressing a button.

Notes on battery

- In normal operation, batteries will last about 6 months. If the camcorder does not operate properly, the batteries might be exhausted. Replace both batteries with new ones.
- Remove the batteries when you do not use the Remote Comander for a long time.

Notes on operation

- If the remote sensor is in sunlight or strong light, you may not be able to operate with the Remote Commander.
- This camcorder works through the signals of commander mode "VTR2". A commander mode is used to distinguish this camcorder from other Sony VCRs ro avoid misoperation. If you use another Sony VCR at commander mode "VTR2", we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.
- Be sur that there are no obstructions between the Remote Commander and the camcorder.

When you connect the receiver of a remote control kit

When you connect the receiver of a remote control kit (not supplied) to the REMOTE control connector, be sure to set the ■ REMOTE COMMANDER switch to OFF.

Getting the Most out of Your Battery Pack

This section shows you how you can get the most out of your battery pack.

Preparing the Battery Pack

Always carry additional batteries.

Have sufficient battery pack power to do 2 to 3 times as much recording as you have planned.
"Battery life" indicated in this manual is measured by the continuous recording time of the camcorder, placed at a room temperature using a fully charged battery.

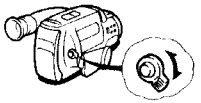
Battery life is shorter in cold environments.

Battery efficiency is decreased and the battery will be used up more quickly if you are recording in cold environments.

Saving battery power

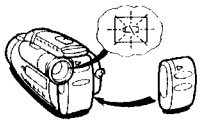
Turn STANDBY on the camcorder down when not recording to save battery power.
A smooth transition between scenes can be made even if recording is stopped and started again.

While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically inside the camcorder and the battery is used. The battery is also used when a tape is inserted or removed.



When to Replace the Battery Pack

When the ☇ indicator inside the viewfinder changes from slow flashing to rapid flashing while you are recording, slide the POWER switch to OFF and replace the battery pack. Leave the tape in the camcorder to obtain smooth transition between scenes after the battery pack is replaced.



Notes on Charging

A brand-new battery

A brand-new battery pack is not charged. Before using the battery pack, charge it sufficiently.

A used battery pack

- Make sure to use up the battery before recharging
- If recording is completed before the battery indicator appears inside the viewfinder, you should remove the tape, set the POWER switch to CAMERA, turn STANDBY up, and leave the camcorder until the ☇ indicator flashes rapidly.
- When you use the AC-S10 AC power adaptor, the DC-S10 car battery charger or BC-S10 portable battery charger, you can use the discharging function.
- **Charging the still usable battery causes a lowering of battery capacity. Battery capacity can be recovered if you fully discharge and charge the battery again.**

After long storage

Recharge the battery pack after a long period of storage.
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.

Charge it again, but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Note on the Terminals

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.

When the terminals are not clean or when the battery pack has not been used for a long time, repeat installing and removing the battery pack. This improves the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Note on the Rechargeable Battery Pack

Battery heat-up is normal.

During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not cause for concern.

Battery care

- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Therefore you should charge the battery right before using the camcorder.

The life of the battery pack

The battery pack can be fully charged and discharged about 500 times under normal temperatures. If the ☇ indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Charging temperature

You should charge batteries at temperatures from 10°C to 30°C (from 50°F to 85°F). Lower temperatures require a longer charging time.

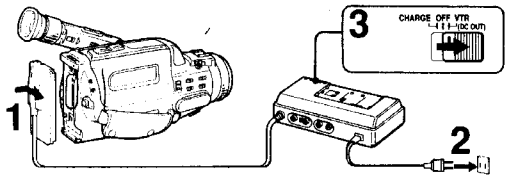
Alternative Power Sources

You can choose any of the following power sources for your camcorder: battery pack (see page 6), household current, and 12/24 V car batteries.
The appropriate power source for you to choose depends on the place where you want to use your camcorder.

Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-55H (supplied), NP-77H/77HD, NP-77, NP-66H or NP-55
Indoors	Household current	AC power adaptor AC-V65/V65A (supplied), AC-V30 or AC-S10
In the car	12 V or 24 V car battery	DC pack DCP-77

Using Household Current

Use the supplied AC-V65/V65A AC power adaptor.



1 Align the right side of the AC power adaptor's connecting plate with the white line on the camcorder, and slide it to the right.

2 Plug the AC power adaptor into a wall outlet.

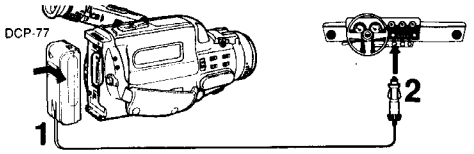
3 Set the CHARGE/VTR switch on the AC power adaptor to VTR.

Removing the connecting plate

Remove it in the same way as you do with the battery pack. See page 7.

Using a Car Battery

You must prepare the DCP-77 DC pack (not supplied).



1 Align the right side of the DC pack with the white line on the camcorder, and slide it to the right.

2 Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V).

Removing the DC pack

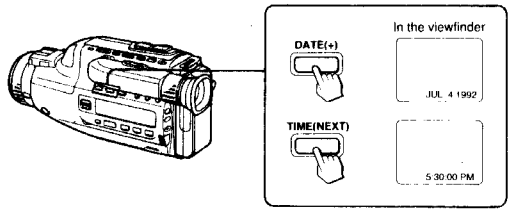
Remove it in the same way as you do with the battery pack. See page 7.

Camera Recording

In Chapter 2, "Basic Operation", you learned the basic recording operations. This section shows you how to record the date or time, store and record an age, re-record a picture and more.

Recording the Date or Time

You can superimpose the date or time.
While you are recording or when the camcorder is in recording standby, press DATE for the date indicator or TIME for the time indicator.
The date or time displayed in the viewfinder is recorded with the picture.

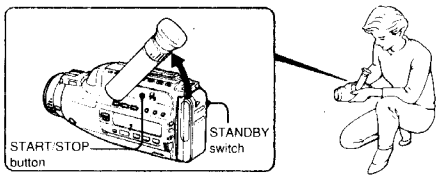


To stop recording with the date or time

Press DATE or TIME again.
The date or time indicator disappears.
The picture recording continues.

Recording in a Low-positions

You can also record in a low-position to get an interesting recording angle.



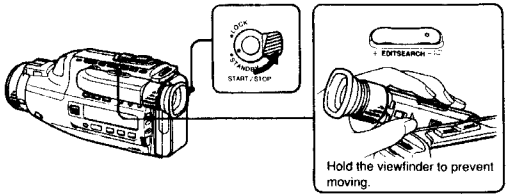
1 Turn the viewfinder up. (You can turn it up to 180 degrees.)
2 Turn the viewfinder adjustment ring clockwise completely (This makes the viewfinder the sports finder).
3 Turn STANDBY up.
4 Press START/STOP.

To stop recording

Press START/STOP.

Checking the Recorded Picture inside the Viewfinder (EDITSEARCH)

Using EDITSEARCH, you can review the last recorded scene or check the recorded picture inside the viewfinder.
After checking your recorded picture, you can also re-record over a previously recorded portion.



Reviewing the last recorded scene — Rec Review

You can check the last portion of a scene you just recorded in CAMERA mode. This is convenient for quick, on-the-spot checks.

1 During recording, set the camcorder in standby mode by pressing the START/STOP button.
2 Press the – (⏪) side of EDITSEARCH momentarily.

The last few seconds of the recorded portion are played back inside the viewfinder. Then, the camcorder goes back to standby mode, ready for the next recording.

Checking your recorded picture (EDIT SEARCH)

You can check the recorded picture inside the viewfinder. After checking, you can also re-record over a previously recorded portion.

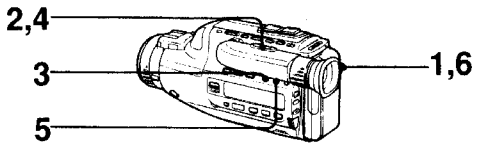
1 Set the camcorder in standby mode by turning STANDBY up.
2 Keep pressing the + or – side of EDITSEARCH to play back the picture while looking inside the viewfinder.
+ side: to view the forward playback picture
– side: to view the reverse playback picture
To stop playback, release EDITSEARCH.
3 To re-record over a recorded portion:
① Press the + side or – side of EDITSEARCH to locate the point you want to begin the re-recording.
② Press START/STOP to begin re-recording.
Re-recording begins from the point you released EDITSEARCH. As long as you do not eject the tape, the transition between the scenes will be smooth.

Monitoring the sound while viewing the playback picture in the viewfinder

1 Connect headphones (not supplied) to the Ω (headphone) jack.
2 While pressing the small green button on the POWER switch, slide it to VTR.
3 Press ◀◀ to rewind the tape and press ❙❙ where you want to stop.
4 Press ▷ to start playback.

Inserting a Scene in the Middle of a Recorded Tape (Insert Recording)

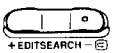
You can insert a scene in the middle of a recorded tape by setting the starting point and ending point. The previously recorded portion will be erased.



1 **Set the cameorder in standby mode by turning the STANDBY switch up.**

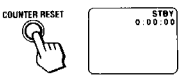
2 **While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.**

The camcorder enters standby mode again.



3 **Press COUNTER RESET.**

The counter is reset to zero.
This works as an end point mark.

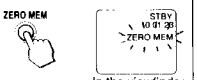


In the viewfinder

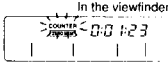
4 **While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.**

5 **Press ZERO MEM.**

The insert ending point is stored in memory.



In the viewfinder



In the display window

6 **Press START/STOP.**

Insert recording begins. The insert recording stops automatically at the counter zero point.

To cancel the ZERO MEM

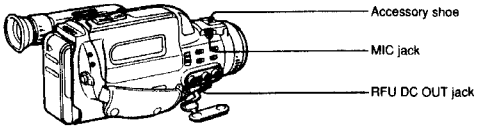
Press ZERO MEM.

Note The picture may be distorted at the ending point when played back.

Recording with an External Microphone

You can connect an external stereo microphone (not supplied) to the MIC jack. This jack also accepts a "plug-in-power" microphone. The power of this type of microphones is supplied from the camcorder through this jack.

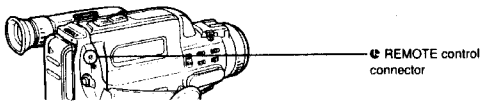
Attach the microphone to the accessory shoe of the camcorder.



Note The camcorder can reduce the noise resulting from the wind. However, you cannot use this feature when you use an external microphone

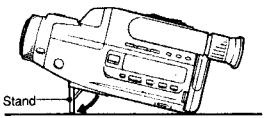
Connecting a Wired Remote Control Unit

When you connect a wired remote control unit or editing controller (not supplied) to the L REMOTE control connector, you can operate your camcorder from a distance.



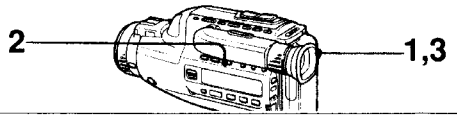
Using the Stand

This camcorder has a stand at the bottom. Use the stand when you want to place the camcorder on a table or on the ground so that the camcorder looks upward.
Pull out the stand until it locks.
When you have finished using the stand, make sure that you replace it into its original position by pressing it in.



Recording an Age

You can put the age of your children in your video while recording. You cannot add the age later during playing back or editing.



1 During recording, press START/STOP at the point you want to insert the age of a person or the elapsed time.

This puts the camcorder in standby mode.

2 Press AGE/EVENT to select the indicator you want to record.

Each time you press AGE/EVENT, the indicator in the viewfinder changes as follows:

1 The first age → 2 The second age
↑ ← 3 The third event ←

An item with no presetting is skipped.
The 1, 2, or 3 indicator goes out after one second.

In the display window the indicator changes as follows:

1 → 2
↖ ↙
3

3 Press START/STOP.

Recording starts again.
The indicator in the viewfinder is recorded with the picture.

To stop recording with the age

Press AGE/EVENT until the indicator goes out.

To change the display while recording

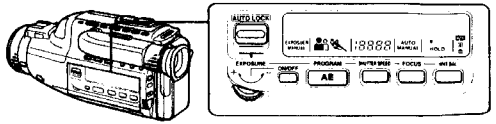
Press AGE/EVENT until the indicator you want to record is displayed. Recording of the indicator you select starts when the indicator number 1, 2, or 3 goes out.

When you connect the camcorder to a TV during recording

The age indicator will appear on the TV screen when the 1, 2, or 3 indicator goes out in the viewfinder and recording starts. Do not use the DATA SCREEN function, otherwise 1, 2 or 3 will also be recorded.

Selecting Automatic/Manual Adjustment Mode

This section shows you how to record by using manual adjustment functions. The camcorder's automatic functions offer you worry-free operation under most shooting conditions. But in some circumstances, manual adjustment is better for creative recordings. You can manually adjust focus, white balance, exposure, and shutter speed with this camcorder. You can also select the recording mode with the PROGRAM AE button to meet the shooting situations.



Automatic adjustment

Slide the AUTO LOCK switch to the green position.
The camcorder adjusts the focus, white balance and exposure automatically. It also sets the shutter speed to 1/60.

Manual adjustment

Slide the AUTO LOCK switch down.
You can adjust the focus, white balance, exposure and shutter speed manually. Even if you slide the AUTO LOCK switch down, only the settings you make during manual adjustment are changed. The other settings remain the same as those in automatic adjustment.

About the settings you made

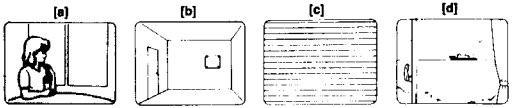
The settings you made during manual adjustment are retained in the following cases.
- When you set the POWER switch to OFF.
- When you slide the AUTO LOCK switch to the green position after you have made manual adjustment, and then slide it down again.

The settings are canceled, however, if more than 5 minutes have passed after you detached the power source.

Focusing Manually

When to Use Manual Focus

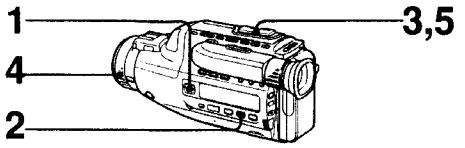
In the following cases you would obtain better results by adjusting the focus manually.



[a] Too much brightness behind the subject
[b] Subjects with little contrast — wall, sky, etc.
[c] Horizontal stripes
[d] Subjects through frosted glass
- Insufficient light
- One subject is close; the other is in the center, but at a distance
- Subjects beyond nets, etc., or another subject passes in front of the camcorder
- Bright subject or subject reflecting light
- High contrast behind the subject (the background may be in focus)
- When shooting a stationary subject using a tripod
- When you want to save battery power

Focusing Manually

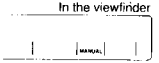
When adjusting the focus manually, the best way is to first adjust at the telephoto position before recording, then set the desired zoom angle.



1 **Slide the AUTO LOCK switch down.**

2 **Press FOCUS.**
appears in the viewfinder, and MANUAL appears in the display window.

In the viewfinder



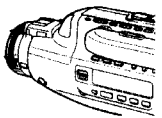
In the display window

3 **Keep pressing the T side (telephoto) of the power zoom button until the zooming stops.**
The power zoom indicator appears in the viewfinder.

In the viewfinder

4 **Turn the focus ring to achieve sharp focus.**

Note
The focus ring does not have a stop position.



5 **Set the desired focal length by pressing the power zoom button.**

Resetting autofocusing

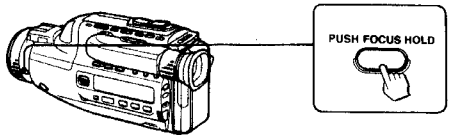
Press FOCUS until in the viewfinder disappears. "MANUAL" disappears and "AUTO" appears in the display window.

Shooting in relatively dark places

When shooting in relatively dark places such as indoors, the depth of field in proper focus becomes very shallow. For best results, shoot at wide angles after focusing in telephoto.

Fixing the Focus to the Object

When shooting a certain object with automatic focusing, the object on which you want to focus becomes suddenly out of focus. This may happen when something abruptly passes in front of the object you are shooting. To avoid this, use the PUSH FOCUS HOLD button to fix the focus to the object you want to shoot.



1 **Focus the object you want to shoot.**

2 **Keep pressing PUSH FOCUS HOLD during recording.**
As long as you hold the button, the automatic focus is inactivated (the indicator appears inside the viewfinder) and the focus is fixed to the object you want to focus.

To restore the automatic focusing mode, release PUSH FOCUS HOLD.

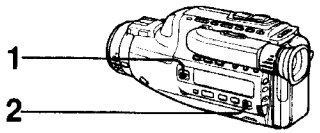
Adjusting the White Balance

What is white balance?

White balance is the adjustment to make white subjects look white and to obtain a more natural color balance for camera recording.
In the following cases, you should obtain better results by adjusting the white balance manually.

Conditions	White balance mode (indicator inside the viewfinder)
Lighting conditions change quickly	(indoor)
Conditions too bright, such as in photography studios	
Under sodium lamps	
Under mercury lamps	
Monochromatic subject or background	HOLD
Under a color matching fluorescent lamp	(outdoor)
Recording: • a sunset/sunrise • just after sunset • just before sunrise • neon signs, fireworks	

Adjusting the White Balance

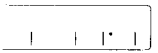


1 **Slide the AUTO LOCK switch down.**

2 **Select the white balance mode by pressing WHT BAL.**
Each time you press the button, the indicator in the viewfinder and the display window changes as follows.
No indicator (auto) → HOLD → ☀ (outdoor) → ☃ (indoor)

In the viewfinder

In the display window



Note

When you adjust the white balance manually, make sure you readjust white balance everytime you move from indoors to outdoors, or vice-versa.

Locking the White Balance Setting (HOLD MODE)

HOLD mode allows you to lock in to certain white balance level.

What is HOLD mode?

When you set the white balance at HOLD mode, the last automatic white balance setting you made will be locked and maintained even if lighting conditions change. You should obtain better results by using the HOLD position when you shoot monochromatic subject or backgrounds.

To enter HOLD mode

1 Slide the AUTO LOCK switch to the green position.
The camcorder adjusts the white balance automatically.
2 Point the camcorder at a white, flat object such as a white wall or paper for about 15 seconds.
3 Slide the AUTO LOCK switch down.
4 Press WHT BAL to display the HOLD indicator in the viewfinder and the display window.

Using the High-speed Shutter

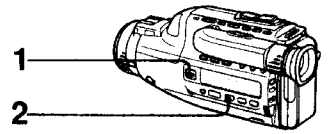
When you record a fast-moving subject, choose a higher shutter speed. The movement will look sharper during freeze frame when the tape is played back with an 8mm recorder that has the clear still function. Remember that you need enough lighting to use the high-speed shutter.

To choose the best shutter speed

Example use	For your selection
• On clear days, recording golf of tennis swing (To view the hit ball clearly in the still picture mode, set to 1/10000 or 1/4000) • Recording skiers	1/10000 or 1/4000 or 1/2000
• On overcast days, recording a moving carousel or roller coaster • Recording outdoors from inside a moving vehicle (for stable shooting)	1/1000 or 1/250
• Instead of using the ND2 (neutral density) filter (To reduce the exposure level to about half) • Recording indoor sports (for stable shooting)	1/100

Selecting the Shutter Speed

You can select the shutter speed from 1/60 to 1/10000.

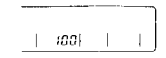


1 **Slide the AUTO LOCK switch down.**

2 **Select the shutter speed by pressing SHUTTER SPEED.**
Each time you press the button, the indicator in the viewfinder and the display window changes as follows.

No indicator (1/60) → 100 (1/100) → 250 (1/250) → 1000 (1/1000)
↓
10000 (1/10000) ← 4000 (1/4000) ← 2000 (1/2000)

In the viewfinder



In the display window

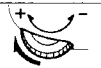
Note on lighting

When you use shutter speed 1/250 or faster, record under sunlight or use a video light.

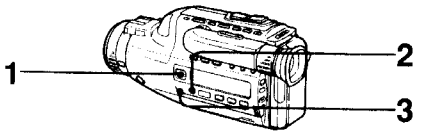
Adjusting the Exposure

When to Adjust the Exposure

In the following cases, you would obtain better results by adjusting the exposure manually.

Conditions	Turn the EXPOSURE dial:
The background is too bright (backlighting)	 in the + direction
Insufficient light: most of the picture is dark.	
Bright subject and dark background	in the – direction
To record the darkness faithfully.	

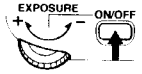
Adjusting the Exposure Manually



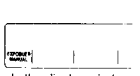
1 **Slide the AUTO LOCK switch down.**

2 **Press EXPOSURE ON/OFF.**

The exposure is locked at the present brightness. The exposure indicator appears inside the viewfinder and EXPOSURE MANUAL appears in the display window.



In the viewfinder


In the display window

3 **Adjust the exposure by turning the EXPOSURE dial in the + or – direction.**

The exposure is locked at the adjusted brightness.

Resuming the automatic exposure mode

Press EXPOSURE ON/OFF so that the exposure indicators disappear, or set the AUTO LOCK switch to the green position.

Using Program AE

When you use the PROGRAM AE (Auto Exposure) function, you can create a "portrait" effect (shallow depth of field) or capture high-speed action with the "sports" mode or "high-speed shutter" mode.
Program AE automatically selects just the right combination of shutter speed and aperture settings and gives you creative control of depth of field (range of that will be in sharp focus).

When to Use Each Mode

You may want to use the respective mode when shooting the following subjects or when shooting under following conditions.

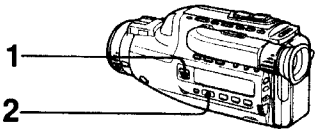
Portrait mode

- A still subject such as a person or a flower
- Subject behind such obstacles as a net
- Zooming on a subject in telephone mode

Sports mode

- Recording a landscape while in a moving car
- Outdoor sports scenes such as football or tennis
- Subjects moving at high speed such as a roller coaster

Setting Portrait or Sports Mode



1 **Slide the AUTO LOCK switch down.**

2 **Press PROGRAM AE.**

The PROGRAM AE indicator appears in the viewfinder and the display window. Each time you press the button, the PROGRAM AE indicator changes as follows:

No indicator (automatic mode) → (portrait mode) → (sports mode) →

In the viewfinder

In the display window

Resuming automatic mode

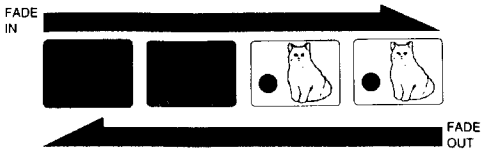
Press PROGRAM AE to turn off the PROGRAM AE indicators, or set the AUTO LOCK switch to the green position.

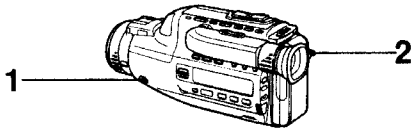
Note

Use sports mode in sunlight. Otherwise use a video light.

Fade-in and Fade-out

You can fade-in or fade-out to give your recording a professional touch.
When fading-in, the picture will gradually appear from black, while increasing the sound.
When fading-out, the picture will gradually fade to black, while decreasing the sound.
You can also fade-in or fade-out the title superimposed.





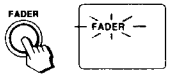
1 **Select the type of fade by pressing FADER as follows:**

When fading-in

After turning the STANDBY switch up to put the camcorder into standby mode, press FADER.
FADER starts flashing.

When fading-out

Press FADER while recording.
FADER starts flashing.



In the viewfinder

2 **Press START/STOP.**

When fading-in

FADER stops flashing and the recording starts fading in.

When fading-out

FADER stops flashing and the picture fades out and then the recording stops.

To cancel the fade-in/fade-out function

Before pressing START/STOP, press FADER again.

Using the fade-in/fade-out function repeatedly

Start from step 1 each time.

When the date/time (page 24), or age (page 28) is displayed

The date/time, or age does not fade-in or fade-out.

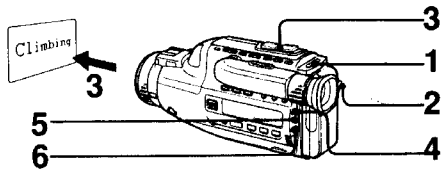
Superimposing Text

This section shows you how to superimpose your own hand written message (title) or graphics over the scene.

In the viewfinder

Storing a Title

You can store one title at a time.
Before you store the title, make a card for the title. Use a plain, white card and write a title with a dark-colored marker in thick letters. You can also use a graphics or a sign if they are thick enough and have contrast.
Before you begin, make sure that the lithium battery is installed.



1 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

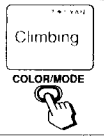
2 **Turn the STANDBY switch up to put the camcorder into standby mode.**

3 **Aim the camcorder at the title card and adjust the focus using the macro position (see page 16).**

4 **Press MEMORY to store the title.**

(Continued)

5 **Press COLOR/MODE and select the title color.**
Each time you press the button, the indicator changes as follows:
WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK(black) ← YEL(yellow) ← VIO(violet) ← RED



6 **Press SUPERIMPOSE ON/OFF to turn off the title.**
Now, the title is stored in memory.

Checking the title

Press SUPERIMPOSE ON/OFF in standby mode.
To turn off the title, press the button again.

Title Display Modes

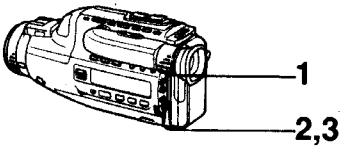
You can scroll your title up and down like scrolling credits in a movie. Also, you can reverse the title.

Display mode	Indicator in the viewfinder
Scrolling the title up The title scrolls up and stops at the center.	↑
Scrolling the title down The title scrolls down and stops at the center.	↓
Reversing the title with the picture	
Scrolling the reversed title up	
Scrolling the reversed title down	
Normal display mode	**No indicator**

Superimposing a Title on Your Tape

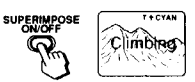
You can superimpose a title during recording, playback, and editing. The following example shows you how to superimpose a title with the scrolling up effect.
The color name and the display mode indicators inside the viewfinder will not be recorded.

Before superimposing the title, store it in the camcorder.



1 **In recording standby mode or playback mode, press COLOR/MODE to select the title display mode.**
(For the display mode of the title, see page 38.)

2 **In recording standby mode or playback mode, press SUPERIMPOSE ON/OFF at the point you want to insert the title.**
The title appears.



3 **Start recording.**

4 **At the point you want to turn off the title, press SUPERIMPOSE ON/OFF again.**
The title goes out.

Function of the COLOR/MODE button

This button has a double function: one is to select the title color and the other is to select the title display mode.
If the title is displayed, this button acts as the color selection button, but if it is not, it acts as the mode select button.

Superimposing a title at the beginning

1 Set the camcorder in standby mode.
2 Press SUPERIMPOSE ON/OFF.
3 Start recording with the title displayed in the viewfinder.
4 At the point you want to turn off the title, press SUPERIMPOSE ON/OFF again.

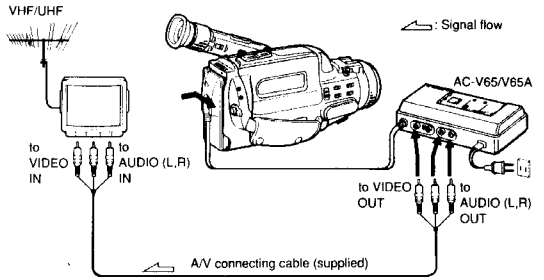
Notes on displaying a title during playback

- You can display the title during playback, pause and slow playback modes. When displaying the title in playback mode, the title disappears if you press ◀◀ (REW) or ▶▶ (FF).
- During playback, the title is not recorded on the tape.

Playing Back a Tape

This section describes several other methods to connect your camcorder to your TV depending on the type of the TV in order to play back a picture on the TV.
To connect a TV that has an S video input, see page 17.

Connecting a TV with Video/Audio Inputs



1 Connect the TV and the AC power adaptor using the supplied A/V connecting cable. If your TV is a monaural type, connect only the white plug of audio both on the camcorder and the TV. Do not use the red plug.
2 Plug the AC power adaptor to a wall outlet.
3 Attach the connecting plate of the AC power adaptor to the camcorder.

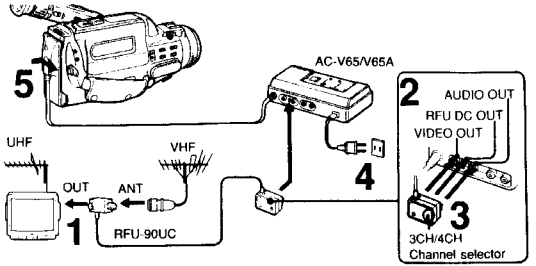
Note on the video/audio jacks of the AC power adaptor

They are used only for video and audio signals output. You cannot use them to record from another VCR.

Advantage of this connection

Keep the TV and AC power adaptor connected. From the next time, you only need to attach the connecting plate to the camcorder.

If Your TV Has Only an Antenna Input

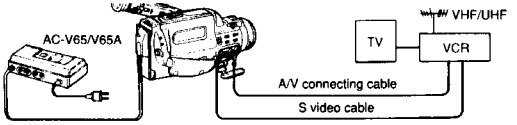


1 Unplug the antenna cable from the TV.
Plug the tail-end marked OUT of the RFU adaptor into the antenna input to your TV.
Re-wire the antenna cable you unplugged to the RFU adaptor marked ANT.
This way you can switch between TV broadcasts and a video playback without rewiring.
2 Connect the RFU adaptor to the AC power adaptor.
3 Set the channel selector on the RFU adaptor (and your TV channel) to 3CH or 4CH of the VHF channel, whichever is not active (vacant) in your area.
4 Plug the AC power adaptor to a wall outlet.
5 Attach the connecting plate of the AC power adaptor to the camcorder.

Connecting to a TV via a VCR

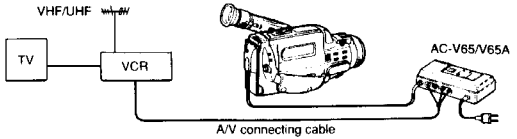
Using the S video and A/V connecting cables

Connect the supplied S video and A/V connecting cables to the VCR instead of the TV.
Set the input selector of the VCR to LINE, if available.



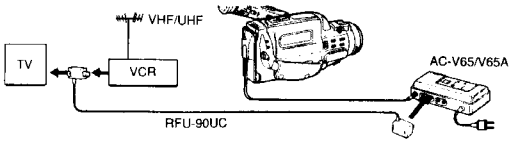
Using the A/V connecting cable

Connect the supplied A/V connecting cable to the VCR instead of the TV.
Set the input selector of the VCR to LINE, if available.



Using the RFU adaptor

Disconnect the antenna connection between the TV and the VCR, and connect the RFU adaptor to the VHF/UHF input of the TV and VHF/UHF output of the VCR.



Playing Back a Tape at Various Speeds

Viewing a still picture (playback pause)

Press **II** during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ or **II**.

Note

When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

Viewing a picture at 1/5 speed (slow playback) (only on the Commander)

Press **I►** during playback.
I► appears in the viewfinder.
To resume normal playback, press ▷.
After about one minute of slow playback, it shifts automatically to normal playback speed.

Locating the desired scene (picture search)

Keep pressing **◄◄** or **►►** during playback or in still picture mode. ⇔ or ⇔ appears in the viewfinder.
To resume normal playback, release the button.

Locating the desired scene quickly (skip scan)

Press **◄◄** during rewind or **►►** during fast forward. ⇔ or ⇔ appears in the viewfinder.
To resume normal playback, press ▷.

Note

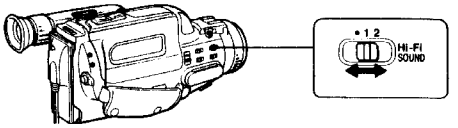
During various playback modes, streaks appear on the screen and the sound is muted.

Making the same display appear in the viewfinder on the TV

Press DATA SCREEN.
To turn the display off, press it again.

Selecting the monitor sound

You can select the playback sound with the Hi-Fi SOUND switch.



- Normally set the Hi-Fi SOUND switch to ● position.
- When the tape with dual sound tracks is played back, set the Hi-Fi SOUND switch to the desired sound, 1 or 2.
- When you connect to a TV using an RFU adaptor, or when the TV or VCR is a monaural type, set the Hi-Fi SOUND switch to 1 or 2.

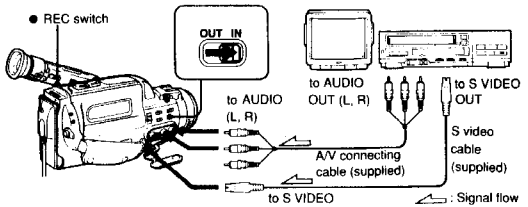
Recording

Recording from a VCR or TV

You can record a tape from another VCR or a TV, both of which are equipped with video/audio outputs.

Connection

- Disconnect the RFU adaptor from the AC power adaptor if it is connected.
- Make the connection using the supplied A/V connecting cable.
- If your TV has an S video output jack, connect it to the S VIDEO jack on the camcorder using the S video connecting cable (supplied). In this case, you do not need to connect the yellow (video) plug of the A/V connecting cable.
- When the cable plugs are connected to both the S VIDEO jack and the VIDEO jack on the camcorder, the signal input to S VIDEO is selected automatically. To use VIDEO jack, disconnect the S video connecting cable.
- If your TV is a monaural type, connect only the white plug for audio both on the camcorder and the TV or the VCR. Do not use the red plug. In this case, the sound will be in monaural.



Recording

1 Set the IN/OUT selector on the camcorder to IN.
2 Set the POWER switch of the camcorder to VTR.
3 Insert a tape.
4 Turn on the VCR or TV.
5 Play back the tape or select the TV channel to be recorded.
6 Slide ● REC.
Recording starts. You can monitor the picture being recorded in the viewfinder.

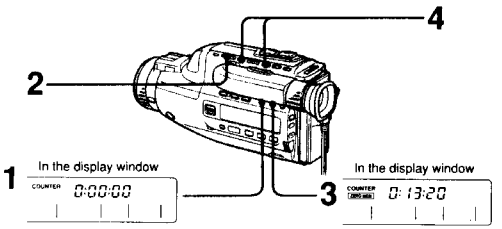
Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

Counting the whole tape

Press COUNTER RESET at the beginning of the tape so that the counter in the display window displays "0:00:00".

Returning to a pre-registered position



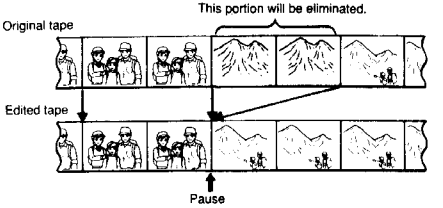
1 During playback, press COUNTER RESET at the point you later want to locate.
The counter shows "0:00:00".
2 Press ❚❚ when playback has finished.
3 Press ZERO MEM.
The "ZERO MEM" indicator flashes in the display window.
Be sure to press ZERO MEM after you stop the tape. It does not function during recording or playback.
4 Press ◀◀ or ▶▶.
The tape rewinds or advances and stops automatically when the counter reaches near zero.

Note

The counter reading and the point on the tape may not correspond exactly. Use the counter as a guide.
There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back a tape recorded in both LP (Long Play) and SP (Standard Play) modes mixed.

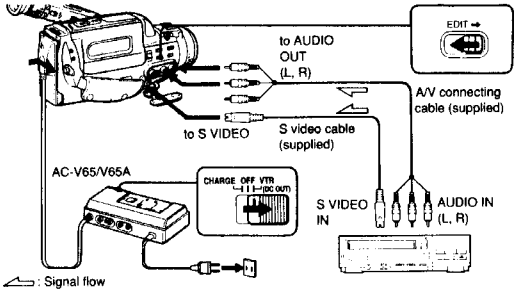
Editing Tapes with a VCR

You can create your own video program by editing with any other 8 8mm, Hi8 Hi8 mm, B Betamax, ED Betamax, VHS VHS, S-VHS S-VHS, VHSC VHSC, S-VHSC S-VHSC VCRs that has video/audio inputs.
You can superimpose the title during editing.



Connection

- Make connections using the supplied S video and/or A/V connecting cable and set the CHARGE/VTR selector on the AC power adaptor to VTR. Be sure to set the IN/OUT selector to OUT.
- Set the input selector of the VCR to LINE, if available.
- If your VCR does not have an S video input jack, connect the VCR to the AC power adaptor as shown on page 40.



Editing a tape

1 Insert a tape to be recorded on into the recording VCR.
2 Slide the EDIT switch on the camcorder in the direction of the arrow.
3 Set the POWER switch on the camcorder to VTR, and then insert the recorded tape into it.
4 Play back a tape on the camcorder until you locate the point where you want to start editing, and then set the camcorder to playback pause mode.
5 On the recording VCR, locate the recording starting point and set the VCR to recording pause mode.
6 Press ❚❚ PAUSE on the camcorder and VCR simultaneously to start editing.

To edit more scenes

Repeat steps 4 to 6.

To stop editing momentarily

Press ⏸ (PAUSE) on the recording VCR.

To stop editing

Press ⏹ (STOP) on both VCRs.

Note on DATA SCREEN function

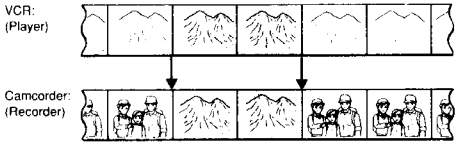
If you have displayed the viewfinder screen indicators on the TV (DATA SCREEN function), erase the indicators by pressing DATA SCREEN so that they will not be superimposed on the edited tape.

Use of the EDIT switch

When you set EDIT in the direction of the arrow (EDIT ON), you can minimize the picture deterioration that results from editing. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

Replacing Recordings on a Tape (Insert Editing)

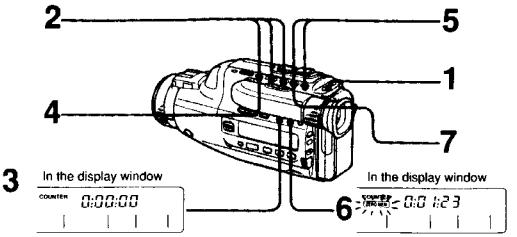
You can insert a new scene from a VCR on your originally recorded tape by setting the starting point and ending point.



Connection

Connections are the same as in "Recording from a VCR or TV" (page 43). Before you start to replace recordings, **set the VCR to playback pause mode at the beginning of the scene to be recorded.** Set the CHARGE/VTR selector on the AC power adaptor to VTR.

Replacing recordings



1 Set the POWER switch on the camcorder to VTR.
The counter appears in the display window.
2 Locate the end point where the insert should end by pressing ◀◀ or ▶▶ during playback.
3 At the end point, press COUNTER RESET.
The counter is reset to "0:00:00".
4 By pressing ◀◀, locate the start point where the insert should start.
5 At the start point, set the camcorder into recording pause mode.
Slide REC in the direction of the arrow while pressing PAUSE.
6 Press ZERO MEM.
The end point of the insert is stored in memory.
7 Press ⏸ PAUSE on both units to start insert editing.
You can monitor the picture being inserted in the viewfinder screen.
The insert recording will stop automatically near the zero point on the counter.

Changing the end point

Press ZERO MEM so that the ZERO MEM indicator disappears, and repeat steps 2 to 7.

Chapter 4: For Your Information

Usable Cassettes and Recording/Playback Modes

This section describes the usable cassettes and recording/playback modes with your camcorder.

Selecting Cassette Types

The Hi8 system is an extension of the standard 8 mm system, and was developed for a higher quality picture.
You can use Hi8 video and standard 8 mm cassettes with your camcorder.
But, when you want to record in Hi8 system, you can use only the Hi8 video cassettes. A standard 8 mm cassette cannot be recorded in the Hi8 system.

When the **Hi8** AUTO/OFF switch is set to AUTO, the recording system is automatically selected according to the type of cassette you are using.
— Hi8 cassette recorded in the Hi8 system.
— Standard 8 mm cassette recorded in the standard 8 mm system.

If you use a Hi8 cassette in the standard 8 mm recording system, set the Hi8 AUTO/OFF switch to OFF while recording.

To Record in	Use Cassette Type	Set of the **Hi8** AUTO/OFF switch to
Hi8 **Hi8** system	Hi8 type	AUTO
Standard 8 mm 8 system	Hi8 type	OFF
	Standard 8 mm type	AUTO or OFF

If you are going to play back the tape using a standard 8 mm video recorder, you should record the tape in the standard 8 mm system.

When You Play Back

The playback mode is selected automatically according to the recording system (Hi8/standard 8mm, SP/LP) with which the tape has been recorded.

AFM Hi-Fi stereo

In the following cases, the sound will be in monaural.
- When you play back a tape recorded with this camcorder on an AFM Hi-Fi monaural video recorder.
- If you play back a tape with this camcorder that has been recorded on AFM Hi-Fi monaural video recorder

Dual sound

You can playback a dual sound recorded tape.
Set the Hi-Fi SOUND switch to "1" or "2". For details, see page 43.

Foreign 8 mm video

You may not be able to play back foreign pre-recorded software because of the difference in the TV color systems.

LP mode

When you play back a tape recorded in LP (long play) mode, the LP indicator lights up inside the viewfinder. This camcorder cannot record tape in LP mode.

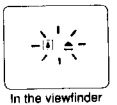
Maintenance Information

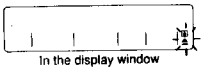
Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

If moisture condenses inside the camcorder

- The indicator in the viewfinder and the display window flashes.
  When a tape is inserted, the ⏏ indicator also flashes.
- Several beeps sound continuously for about 5 seconds when the BEEP switch is set to ON and a tape is inserted.

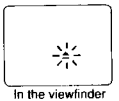

In the viewfinder

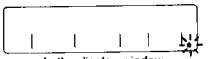

In the display window

In such cases, no functions, except for tape ejection, work.
Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least 1 hour.
The camcorder can be used if the indicator does not appear when the power is turned on again.

If moisture condenses on the surface of the tape

- The ⏏ indicator flashes in the viewfinder and the display window when a tape is inserted and a tape transport button (▷, ◀◀, etc.) is pressed.
- Several beeps sound continuously for about five seconds when the BEEP switch is set to ON.


In the viewfinder


In the display window

In such cases, no functions, except for tape ejection, work.
Eject the tape and let the camcorder and the tape sit for at least 1 hour.
The tape can be used if the ⏏ indicator does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No caution indicators will appear, but the picture becomes dim.
Turn off the power and do not use the camcorder for at least 1 hour.

How to prevent moisture condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

1 Be sure to tightly seal the plastic bag containing the camcorder.
2 Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about one hour).

Video Head Cleaning

To ensure a clear picture, clean the video heads periodically

When playback pictures become noisy or hardly visible, the video heads may be contaminated.

If this happens:

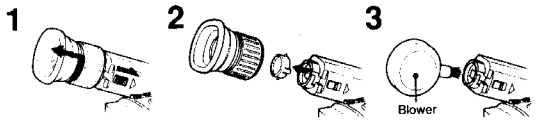
1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2 After cleaning, check to see if the picture is clear by recording on or playing back an ordinary tape.
3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Caution Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

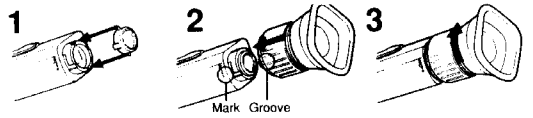
Viewfinder Cleaning

Cleaning the viewfinder



1 While pressing the RELEASE knob on the viewfinder barrel down, turn the eyecup in the direction of the arrow, and detach it.
2 Remove the lens using a pointed object.
3 Clean the surface of the screen with a commercially available blower.

Reattaching the eyecup



1 Replace the lens. Do not place it upside down.
2 Align the groove on the eyecup with the ● mark on the barrel and insert the viewfinder.
3 Turn the eyecup in the opposite direction of the arrow.

Tips for Better Camera Recording

Achieving a Better Camera Recording

Assume a good posture for shooting

For hand-held shots, it is important to hold the camcorder properly.

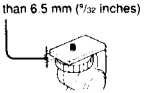
- Hold the camcorder firmly and secure it with the grip strap so that you can easily operate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus, make sure the camcorder does not move.
- Face the subject and assume a comfortable stance.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod

If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

Caution

When attaching a tripod not manufactured by Sony, make sure that the length of the camera mounting screw is less than 6.5 mm (9/32 inches). Otherwise the screw may damage the camcorder.



Keep the horizontal plane level

You can easily determine the horizontal plane by using the viewfinder frame as a reference.

Shoot with the sun behind you

When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

Use video light in the dark

To get the best colors, you must maintain a sufficient light level.

Using Your Camcorder Abroad

Each country has its own electricity system and TV color system. Before using your camcorder abroad, check the following points.

Power sources

You can use your camcorder in any country with the supplied AC power adaptor where the electricity is 110 V to 240 V AC, 50/60 Hz.

Difference in color system

This camcorder is an NTSC system based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system based TV or PAL-M system based TV with NTSC/PAL-M transcoder. Check the following alphabetical list.

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, The Philippines, U.S.A., Venezuela, and others.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, former West Germany, Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, and others.

PAL M system country
Brazil

PAL N system countries
Argentina, Paraguay, Uruguay

SECAM system countries
Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, and others.

Note on the supplied RFU adaptor

You can use the supplied RFU adaptor only at the country where you bought this camcorder. Since each country has its own electricity and TV color system, you may not be able to use the RFU adaptor when you use the camcorder abroad.

Precautions

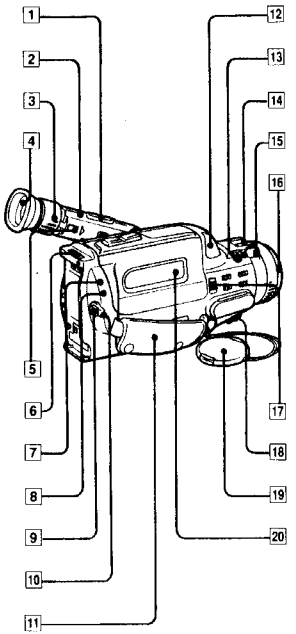
On operation

- Operate the camcorder on 6.0 V (battery pack) or 7.5 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not pick up the camcorder by the viewfinder.
- Avoid rough handling or hitting the unit. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder.**
  When you use the camcorder on a beach or dusty place, protect it from the sand or dust. Sand or dust may cause the camcorder to malfunction and sometimes the malfunction cannot be eliminated.
- **Do not let the camcorder get wet.**
  Keep the camcorder from rain or sea water. Water may cause a malfunction and sometimes the malfunction cannot be eliminated.

On care

- When the unit will not be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth. Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

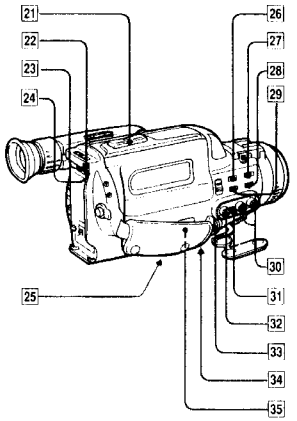
Identifying the Parts

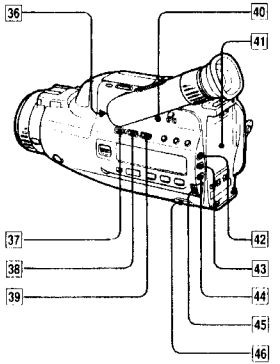


For details on the use of each part, refer to the pages indicated in the circle.

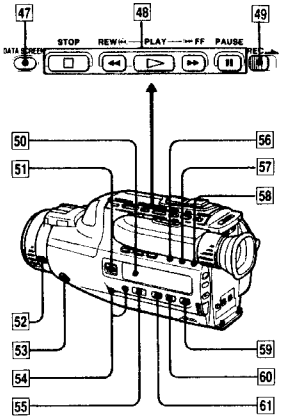
1. **EDITSEARCH (and ⊟ recording review) button** (25) (26)
2. **Viewfinder** (38)
3. **Viewfinder adjustment ring** (18)
4. **Eyecup**
5. **RELEASE knob** (28)
6. **POWER switch**
   CAMERA: for camera recording
   VTR: for playing back or editing tapes
   OFF: power off
7. **Ψ REMOTE control connector (stereo mini-minijack)** (27)
8. **Ω (headphone) jack (minijack)** (23)
9. **START/STOP button** (15)
10. **STANDBY switch** (13)
11. **Grip strap** (14)
12. **Stereo built-in microphone**
13. **MIC jack (PLUG IN POWER) (stereo minijack)** (27)
14. **Accessory shoe** (35)
15. **Remote control sensor** (15)
16. **Focus ring** (10)
17. **EJECT (cassette eject) knob** (12)
18. **Shoulder strap hook**
19. **Lens cap**
20. **Cassette holder** (12)

About Ψ (LANC)
Ψ (LANC) stands for Local Application Control Bus System. The Ψ control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the connectors indicated as CONTROL L or REMOTE.



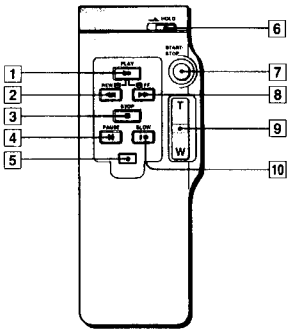


21 Power zoom (MACRO) button
22 Camera recording/battery lamp
23 REMOTE COMMANDER ON/OFF switch
24 BEEP ON/OFF switch
25 Stand
26 Hi8 AUTO/OFF switch
27 Hi-Fi SOUND switch
28 IN/OUT (video and audio input/output) selector
29 EDIT switch
30 AUDIO (L, R) input/output jacks (phono jack)
31 RFU DC OUT (RFU adaptor DC output) jack (special minijack)
32 VIDEO Inout/output jack (phono jack)
33 S VIDEO jack
34 Tripod receptable
35 Lithium battery compartment
36 Camera recording/battery lamp
37 DATE (+) button
38 TIME (NEXT) button
39 AGE (EVENT) button
40 START/STOP button
41 Battery mounting surface
42 MEMORY button
43 COLOR/MODE button
44 SUPERIMPOSE ON/OFF switch
45 BATT (battery eject) knob
46 Shoulder strap hook



47 DATA SCREEN button
48 Tape transport buttons
▷ PLAY (playback)
▶▶ FF (fast-forward)
◀◀ REW (rewind)
□ STOP
II PAUSE
49 ● REC (recording) switch
50 Display window
51 AUTO LOCK switch
52 PUSH FOCUS HOLD button
53 FADER button
54 EXPOSURE ON/OFF button and dial
55 PROGRAM AE button
56 COUNTER RESET button
57 ZERO MEM (memory) button
58 TAPE/BATT. (battery) CHECK button
59 WHT BAL (white balance) button
60 FOCUS button
61 SHUTTER SPEED button

Wireless Remote Commander

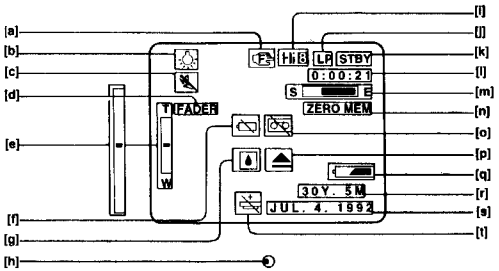


1 ▷ PLAY (play back) button
2 ◀◀ REW (rewind) button
3 □ STOP button
4 II PAUSE button
5 DATA SCREEN button
6 HOLD switch*
7 START/STOP button
8 FF ▶▶ (fast forward) button
9 Power zoom button
10 I▸ SLOW (slow playback) button*

Note
The * indicates the functions which are operable only with the Remote Commander.

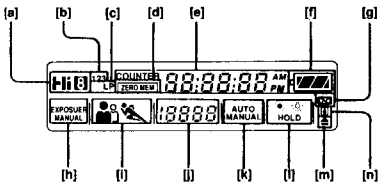
Indicators in the Viewfinder and the Display Window

In the Viewfinder



[a] Manual focusing ()
[b] White balance indicator (, , HOLD)
[c] PROGRAM AE indicator (,)/ shutter speed indicator
[d] FADER is pressed.
[e] Power zoom indicator/Exposure indicator
[f] "Replace battery." ()
[g] Moisture has condensed. ()
[h] Lights up during recording. When flashing: "Replace battery or tape."
[i] Hi8 mode indicator
[j] Playback mode (LP)
[k] Tape transport mode/Title mode
[l] Tape counter
[m] Remaining tape length indicator
[n] ZERO MEM is pressed.
[o] "Replace tape or no tape inside." ()
[p] "Trouble has occurred". () "Clean video heads." ()
[q] Remaining battery indicator
[r] Age
[s] Date or time
[t] "Replace lithium battery". ()

In the Display Window



[a] Hi8 mode indicator
[b] AGE/EVENT memory number
[c] Playback mode (LP)
[d] ZERO MEM is pressed.
[e] Time, date, age or tape counter (when COUNTER is on) indicator
[f] Remaining capacity of battery
[g] "Replace the tape or no tape inside."
[h] Adjusting exposure manually
[i] Program AE indicator
[j] Shutter speed
[k] Focus mode
[l] White balance indicator
[m] "Trouble has occurred."
[n] "Moisture has condensed."

Troubleshooting

If you run into any problems using the camcorder, use the following table to troubleshoot the problem. Should the difficulty persist, contact your Sony dealer or local authorized Sony service facility.

Symptom	Cause	Corrective actions
The power does not turn on.	The battery is not attached.	Attach the battery.
	The battery is used up.	Use a charged battery.
	The AC power adaptor is not connected to a wall outlet.	Connect the adaptor to a wall outlet.
The power turns off.	While being operated in CAMERA mode, the camcorder has been in pause mode for more than 5 minutes.	Turn down the STANDBY switch, and turn it up again.
	The battery is used up.	Use a charged battery.
The battery pack is quickly discharged.	The ambient temperature is too low.	—
	The battery pack has not been charged fully.	Charge the battery pack again.
The START/STOP button does not operate.	The tape is stuck to the drum.	Eject the tape.
	The tape is at its end.	Rewind the tape or use a new one.
	The POWER switch is set to VTR.	Set it to CAMERA.
	The tab on the tape is out (red).	Use a new tape or slide the tab.
The tape cannot be removed from the compartment.	The battery is used up.	Use a charged battery or the AC power adaptor.
No function except for tape ejection works.	Moisture condensation has occurred. (See page 49.)	Remove the tape and do not use the camcorder for at least an hour.
The tape does not move when a tape transport button is pressed.	The POWER switch is set to CAMERA or OFF.	Set it to VTR.
	The tape is at its end.	Rewind the tape or use a new one.
The autofocusing function does not work.	AUTO LOCK is slid down.	Set to the green position.
	Shooting conditions are not suitable for autofocusing operation. (See page 29.)	Adjust the focus manually.
The image on the viewfinder screen is not clear.	The viewfinder lens is not adjusted.	Adjust the viewfinder lens.
A vertical band appears when a subject such as lights or a candle flame is shot against a dark background.	The contrast between the subject and background is too high; the camera is not malfunctioning.	—
The playback picture is not clear.	EDIT is set in the direction of the arrow.	Set EDIT in the opposite direction of the arrow.
	The channel or input for the camcorder is not selected on the TV.	Select correctly.
The picture is noisy.	The video heads may be contaminated.	Clean the heads using the Sony V8-25CLH cleaning cassette. (See page 50.)
When the TV is connected to the camcorder using the VIDEO/AUDIO jacks, the picture on the TV is not clear or moves vertically.	The IN/OUT selector is set to OUT.	Set it to IN.

Troubleshooting

If an indicator flashes in the viewfinder screen and the display window or a caution lamp on the camcorder flashes, check the following table.

slow flashing fast flashing

	Symptom		Cause	Corrective actions
	Viewfinder	Display window		
Camera or VTR operation	Battery lamp		The battery is weak.	Prepare a charged one.
	Battery lamp		The battery is used up.	Use a charged battery
Camera operation	* Battery lamp	*	The tape is at its end.	Use a new tape.
	Battery lamp		The tape is near its end.	Prepare a new one.
			No tape is inserted.	Insert a tape.
	*	*	The tab on the tape is out (red).	Slide the tab.
Camera or VTR operation	* or	* or	Moisture condensation has occurred.	Remove the tape and leave the camcorder for at least an hour.
	Caution lamp	—	The gap of the head is clogged.	Clean the head using the Sony V8-25CLH video head cleaning tape.
	* Caution lamp	*	Other troubles may occur.	Consult your nearest Sony dealer.
	flashes for 5 seconds after setting the POWER switch to CAMERA.	—	The lithium battery is not installed. The lithium battery is exhausted. The lithium battery is weak.	Install a lithium battery with the battery pack or other power source attached. Otherwise, you must readjust the date, time and birth dates.

* In these cases the displayed indicator is accompanied by a series of beeps when the BEEP switch is set to ON.

Specifications

System

Video recording system: Rotary two heads, Helical scanning FM system
Audio recording system: Rotary head, FM system
Video signal: NTSC color, EIA standards
Cassette type: 8 mm video format cassette
Tape speed: SP mode: Approx. 1.43 cm (9/32 inch)/s
LP mode: Approx. 0.72 cm (5/16 inch)/s
(playback only)
Recording time: SP mode: 2 h (E6/P6-120)
Playback time: SP mode: 2 h (E6/P6-120)
LP mode: 4 h (E6/P6-120)
Fast forward/rewind time: Approx. 6 min 30 s (E6/P6-120)
Image device: CCD (Charge Coupled Device)
Viewfinder: Electronic viewfinder (black and white)
Lens: Combined 10 × power zoom lens
f=6.1 to 61 mm (1/4 to 2 1/2 inches)
Approx. 44 to 440 mm (1 3/4 to 17 7/8 inches) converted into the focal length of a 35-mm still camera.
F 1.6 to 2.4
Filter diameter: 37 mm (1 1/2 inches)
TTL autofocus system inner focus wide macro system
Color temperature: AUTO
Minimum illumination: 3 lx
Illumination range: 3 lx to 100,000 lx (0.3 to 9,290 footcandles)
Recommended illumination: More than 100 lx (9.3 footcandles)
Aperture correction: Automatic
With backlight adjustment

Input and output connector

S-VIDEO input/output: Selectable with the IN/OUT selector
4-pin mini DIN
Luminance signal 1 Vp-p, 75Ω, unbalanced, sync negative
Chrominance signal 0.286 Vp-p, 75Ω, unbalanced
Video input/output: Selectable with the IN/OUT selector
Phono jack, 1 Vp-p, 75Ω, unbalanced, sync negative
Audio input/output: Selectable with the IN/OUT selector
Phono jack (L, R)
Input: −7.5 dBs, input impedance more than 47 kΩ
Output: −7.5 dBs, (at load impedance 47 kΩ)
impedance less than 1 kΩ
RFU DC OUT: Special minijack, 5 V DC
Headphone jack: Minijack, 8Ω impedance
Remote ⇵ jack: Stereo mini-minijack
MIC jack: Stereo minijack, −66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kΩ
Microphone power output jack: Special minijack, 5 V DC

General

Power requirements: On battery mounting surface
6.0 V (battery pack)
7.5 V (AC power adaptor)
Power consumption: 6.5 W (camera recording) including the viewfinder
Installation: Vertically, horizontally
Operating temperature: 0°C to 40°C (32°F to 104°F)
Storage temperature: −20°C to +60°C (−4°F to +140°F)
Dimensions: Approx. 118 × 112 × 260 mm (w/h/d) (4 3/4 × 4 1/2 × 10 1/4 in.)
Mass: Approx. 930 g (2 lb 1 oz) excluding the battery pack, lithium battery, cassette, lens cap, jack cover and shoulder strap
Approx. 1150 g (2 lb 9 oz) including the battery pack NP-55H, lithium battery CR2025, cassette P6-120, lens cap, jack cover and shoulder strap
Microphone: Electret condenser microphone, uni-directional, stereo type

Wireless Remote Commander

Remote control system: Infrared control
Command mode: VTR 2
Power requirements: 3 V DC, 2 size AA (R6) batteries
Dimensions: Approx. 48 × 19 × 130 mm (w/h/d) (1 15/16 × 3/4 × 5 1/8 inches)
Mass: Approx. 50 g (1.8 oz) (excluding batteries)

Design and specifications are subject to change without notice.

Index

A

AC power adaptor 6, 17, 22
Accessories 5
Accessory shoe 27
Adjusting viewfinder 13
Age 10, 28
Audio output 17
Audio/Video cable 17
Autofocus 14, 30
Auto lock 14, 29

B

Battery 6
Battery lamp 58
Battery pack 6
Beep 6
Birth date 10

C

Camera recording mode 14
Camera recording lamp 15
Car battery 23
Charging battery 6
Cleaning video head 50
Clock set 9
Close-up 16
COLOR/MODE button 38, 39
Connecting TV 17, 40
Counter reset 26, 44

D,E

Data screen 42
Date/Time 9, 10, 24
Dew indicator 49
Display window 56
Edit switch 45
Editing 45
Editsearch 25
Eject 12
Event 10
Exposure 34
External microphone jack 27
Eyecup 51

F,G,H

Fade-in/Fade-out 36
Fast-forward 42
Headphone jack 25
High speed shutter 33
Hold mode 32
Hold switch 19

I,J,K,L

IN/OUT switch 40
Insert 26, 48
LANC 53
Lens cap 14
Lithium battery 8

M,N,O,P,Q

Manual focus 29
MEMORY button 37
Pause 42
Playback 18
Playback on TV 18, 40
Portrait mode 35
Power sources 22
Power zoom 16
Program AE 35
PUSH FOCUS AUTO button 31

R

Rec review 25
Recording 43
Remote Commander 19
Remote control connector 27
Rewind 18
RFU adaptor 41

S

Shutter speed 33
Skip-scan 42
Slow 42
Specifications 59
Sports finder 13
Sports mode 35
Stand 27
Standby 14
Still picture 42
Stop 15, 18
SUPERIMPOSE button 38, 39

T,U,V

Tape/Battery check 7, 15
Title 37
Tripod mounting 51
Troubles 57
VTR mode 18
Video cassette tape 12
Viewfinder indicator 56

W,X,Y,Z

Warning indicator 58
White balance 31
Zero memory 26, 44
Zoom 16

If you have any question about this product, you may call:

Sony Customer Information Center

East Coast : 201-930-7669 (SONY) NJ
Central : 708-250-7669 (SONY) IL
West Coast : 714-821-7669 (SONY) CA

or write to:

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Park Ridge, NJ 07656

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